Space Weather Forecast

Issued on Thursday, 25 April 2024 at 00:12 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further Moderate flares expected (R1/R2 blackouts). Chance of isolated Minor Geomagnetic Storm intervals from Coronal Mass Ejection (CME) or fast wind effects.

Solar Activity: Activity is currently Moderate with several Moderate-class flares observed in the past 24 hours. The largest of these occurred at 24/2259UTC from the large complex in the southwest. This broad cluster of regions carry a large percentage of the current flare risk, with the spots magnetically connected and a large amount of flux associated with them, suggesting a potential for Strong flares. However, with this group approaching the western limb it is becoming increasingly difficult to analyse. There are seventeen region in total on the disc. Of these, a region in the northwest has developed magnetic complexity, and looks like two separate regions which have pushed together. A further region in the southeast is also showing some minor magnetic complexity.
Multiple Coronal Mass Ejections (CMEs) have been observed in coronagraph imagery over the previous 24hrs, with some potential for the odd glancing blow at Earth.
Solar Wind / Geomagnetic Activity: Solar winds were at background levels. Wind speeds varied between 330-380km/s. The Interplanetary Magnetic Field was weak, with the north-south component also varying weakly. Geomagnetic activity was Quiet (Kp1-2).
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Moderate activity is expected to continue at first, with a slight chance of isolated Strong flares. The cluster of regions in the southwest will fully rotate off the disc late on Day 2 (26 Apr). The flare risk is then expected to decline during Day 3 (27 Apr) as these regions rotate well away from the west limb.
Solar Wind / Geomagnetic Activity: There is a risk of CMEs passing close to Earth throughout the period, largely missing ahead and to the south of our orbit. The greatest potential for any impacts is thought likely to be later Day 2 into early Day 3 (26-27 Apr). Otherwise solar winds are currently at background levels. Two coronal holes in the western disc are likely to bring an increase in wind speeds during this period, most probably during Day 2, with wind speeds perhaps reaching 500-550 km/s.
Overall, geomagnetic activity is likely to be Quiet to Unsettled at first. This has the potential to become Unsettled to Active with a chance of G1/Minor Storm intervals, either under CME or fast wind influence, or perhaps a combination of both. The risk should decline into Day 4 (28 Apr).
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to persist at background levels, but with a slight chance of reaching the S1/Minor Radiation Storm level throughout this period.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	15	30	25	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	75	60	40
Very Active	R3 to R5 X	No	15	15	10	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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